IN THE CLAIMS:

1. (Currently Amended) A polyether polyol formed according to a process comprising the steps of:

a) providing ~~only a C_2 to C_3~~ at least one alkylene oxide ~~or mixture thereof~~;

b) providing at least one initiator molecule having at least one alkylene oxide reactive hydrogen; and

c) reacting the at least one alkylene oxide with the at least one initiator molecule in the presence of an aluminum phosphonate catalyst to form a polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

2. (Currently Amended) The polyether polyol of Claim 1, wherein step a) comprises providing ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin or mixtures of these alkylene oxides.

3. (Original) The polyether polyol of Claim 1, wherein step b) comprises providing as the at least one initiator molecule, an alcohol, a polyhydroxyl compound, a mixed hydroxyl and amine compound, a polyamine compound, or mixtures of these initiator molecules.

4. (Original) The polyether polyol of Claim 1, wherein

a) step b) comprises providing as the at least one initiator molecule, an oligomer comprising the reaction product of a pre-reaction initiator molecule with at least one alkylene oxide and

b) step c) comprises using the oligomer as the initiator molecule.

5. (Original) The polyether polyol of Claim 4, wherein said oligomer has a number average molecular weight of from 200 to 1500 Daltons.

6. (Original) The polyether polyol of Claim 1, wherein step c) comprises providing the aluminum phosphonate catalyst in an amount of from 0.1 to 5.0 weight percent based on the total weight of the polyether polyol.

7. (Currently Amended) The polyether polyol of Claim 1, wherein step c) comprises providing as the aluminum phosphonate catalyst an aluminum phosphonate having the general structure of $RPO\text{-}(OAIR'R'')_2$ wherein: O represents oxygen; P represents pentavalent phosphorous; Al represents aluminum; R comprises a hydrogen, an alkyl group, or an aryl group; and R' and R" independently comprise a halide, an alkyl group, an alkoxy group, an aryl group, or an aryloxy group.

8. (Original) The polyether polyol of Claim 7, comprising providing as the aluminum phosphonate catalyst an aluminum phosphonate wherein: R is a methyl group; and R' and R" independently comprise one of an ethyl group, an ethoxy group, a propyl group, a propoxy group, a butyl group, a butoxy group, a phenyl group, or a phenoxy group.

9. (Currently Amended) The polyether polyol of Claim 1, wherein step c) comprises reacting the at least one alkylene oxide with the at least one initiator molecule in the presence

of the aluminum phosphonate catalyst to form a polyether polyol having an unsaturation of less than or equal to 0.020 [[0.010]] meq/g KOH.

10. (Currently Amended) The polyether polyol of Claim 1, wherein step c) comprises reacting the at least one alkylene oxide with the at least one initiator molecule in the presence of the aluminum phosphonate catalyst to form a polyether polyol having an unsaturation of less than or equal to 0.015 [[0.008]] meq/g KOH.

11. (Cancelled)

12. (Currently Amended) A polyether polyol formed according to a process comprising the steps of:

a) providing ~~only a C_2 to C_3~~ at least one alkylene oxide ~~or mixture thereof~~;

b) providing at least one initiator molecule having at least two alkylene oxide reactive hydrogens;

c) providing an aluminum phosphonate catalyst having the general structure of RPO-(OA1R'R")2 wherein: O represents oxygen; P represents pentavalent phosphorous; Al represents aluminum; R comprises a hydrogen, an alkyl group, or an aryl group; and R' and R" independently comprise a halide, an alkyl group, an alkoxy group, an aryl group, or an aryloxy group; and

d) reacting the at least one alkylene oxide with the at least one initiator molecule in the presence of the aluminum phosphonate catalyst to form a polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or~~

~~equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

13. (Currently Amended) The polyether polyol of Claim 12, wherein step a) further comprises providing ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin or mixtures of these alkylene oxides.

14. (Original) The polyether polyol of Claim 12, wherein step b) comprises providing as the at least one initiator molecule a polyhydroxyl compound, a mixed hydroxyl and amine compound, a polyamine compound, or mixtures of these initiator molecules.

15. (Original) The polyether polyol of Claim 12, wherein

a) step b) comprises providing as the at least one initiator molecule, an oligomer comprising the reaction product of a pre-reaction initiator molecule with at least one alkylene oxide and

b) step c) comprises using the oligomer as the initiator molecule.

16. (Original) The polyether polyol of Claim 12, wherein said oligomer has a number average molecular weight of from 200 to 1500 Daltons.

17. (Original) The polyether polyol of Claim 12, wherein step c) comprises providing the aluminum phosphonate catalyst in an amount of from 0.1 to 5.0 weight percent based on the total weight of the polyether polyol.

18. (Original) The polyether polyol of Claim 12, wherein step c) comprises providing as the aluminum phosphonate catalyst an aluminum phosphonate wherein:

R is a methyl group;

and R' and R" independently comprise one of an ethyl group, an ethoxy group, a propyl group, a propoxy group, a butyl group, a butoxy group, a phenyl group, or a phenoxy group.

19. (Currently Amended) The polyether polyol of Claim 12, having an unsaturation of less than or equal to 0.020 [[0.010]] meq/g KOH.

20. (Currently Amended) The polyether polyol of Claim 12, having an unsaturation of less than or equal to 0.015 [[0.008]] meq/g KOH.

21. (Cancelled)

22. (Currently Amended) A polyether polyol formed according to a process comprising the steps of:

a) providing [[only]] propylene oxide;

b) providing at least one initiator molecule having at least one propylene oxide reactive hydrogen; and

c) reacting the propylene oxide with the at least one initiator molecule in the presence of an aluminum phosphonate catalyst to form a polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

23. (Original) The polyether polyol of Claim 22 comprising the further step of reacting the polyether polyol formed in step c) with ethylene oxide in the presence of an aluminum phosphonate catalyst to thereby form terminal caps of ethylene oxide.

24. (Cancelled)

25. (Previously Presented) The polyether polyol of Claim 23 comprising terminal caps of ethylene oxide in an amount of from 5 to 80% by weight based on the total weight of the polyether polyol.

26. (Original) The polyether polyol of Claim 22 wherein step b) comprises providing at least one diol initiator molecule having at least two propylene oxide reactive hydrogens.

27. (Currently Amended) A heteric polyether polyol formed according to a process comprising the steps of:

a) providing a mixture of ~~only C_2 to C_3~~ alkylene oxides;

b) providing at least one initiator molecule having at least one alkylene oxide reactive hydrogen; and

c) reacting the mixture of alkylene oxides with the at least one initiator molecule in the presence of an aluminum phosphonate catalyst to form a heteric polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

28. (Original) The heteric polyether polyol of Claim 27 comprising the further step of reacting the heteric polyether polyol formed in step c) with ethylene oxide or propylene oxide in the presence of an aluminum phosphonate catalyst to thereby form terminal caps.

29. (Cancelled)

30. (Currently Amended) The heteric polyether polyol of Claim 28 wherein said terminal caps [[of]] comprise ethylene oxide in an amount of from 5 to 20% by weight of the total weight of the polyether polyol.

31. (Previously Presented) The heteric polyether polyol of Claim 28 wherein said terminal caps comprise propylene oxide in an amount of from 5 to 15% by weight of the total weight of the polyether polyol.

32. (Currently Amended) A polyether polyol formed according to a process comprising the steps of:

a) providing [[only]] ethylene oxide;

b) providing at least one initiator molecule having at least one ethylene oxide reactive hydrogen; and

c) reacting the ethylene oxide with the at least one initiator molecule in the presence of an aluminum phosphonate catalyst to form a polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

33. (Original) The polyether polyol of Claim 32 comprising the further step of reacting the polyether polyol formed in step c) with propylene oxide in the presence of an aluminum phosphonate catalyst to thereby form terminal caps of propylene oxide.

34. (Cancelled)

35. (Previously Presented) The polyether polyol of Claim 33 wherein said terminal caps of propylene oxide comprise from 5 to 80% by weight of the total weight of the polyether polyol.

36. (Currently Amended) A polyether polyol formed according to a process comprising the steps of:

a) providing at least one ~~only a C_2 to C_3~~ alkylene oxide ~~or a mixture thereof~~;

b) providing at least one oligomer having at least one alkylene oxide reactive hydrogen; and

c) reacting the ~~at least one~~ alkylene oxide with the at least one oligomer in the presence of an aluminum phosphonate catalyst to form a polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

37. (Original) The polyether polyol of Claim 36 wherein said at least one oligomer has a number average molecular weight of from 200 to 1500 Daltons.

38-40. (Cancelled)

41. (Currently Amended) A linear block copolymer polyether polyol formed according to a process comprising the steps of:

a) providing a first ~~C_2 to C_3~~ alkylene oxide;

b) providing at least one diol initiator molecule having two alkylene oxide reactive hydrogens; and

c) reacting the first alkylene oxide with the at least one diol initiator molecule in the presence of an aluminum phosphonate catalyst to form a linear polyether polyol; and

d) reacting the reaction product of step c) with a second ~~C_2 to C_3~~ alkylene oxide other than the first alkylene oxide in the presence of the aluminum phosphonate catalyst to form a linear block copolymer polyether polyol comprising the aluminum phosphonate catalyst or residue thereof ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~.

42. (Currently Amended) The polyether polyol of Claim 41, wherein the first alkylene oxide and the second alkylene oxide are selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin and mixtures thereof such that the first alkylene oxide is different from the second alkylene oxide.

43. (Currently Amended) A composition of matter comprising:

a) a polyether polyol ~~having an unsaturation of less than or equal to 0.015 meq/g KOH, and a number average molecular weight of 2,000 to 10,000 with no higher molecular weight polyols~~; and

b) an aluminum phosphonate having the general structure of RPO-(OA1R'R")2 wherein:

P represents pentavalent phosphorous;

R comprises a hydrogen, an alkyl group, or an aryl group; and

R' and R" independently comprise a halide, an alkyl group, an alkoxy group, an aryl group, or an aryloxy group.

44. (Original) The composition of matter as recited in Claim 43 wherein:

R is a methyl group; and

R' and R" independently comprise one of an ethyl group, an ethoxy group, a propyl group, a propoxy group, a butyl group, a butoxy group, a phenyl group, or a phenoxy group.

45. (Currently Amended) The composition of matter as recited in Claim 43[[,]] wherein said aluminum phosphonate is present at levels of from approximately 0.01 to 5.0 weight percent based on the total weight of the polyether polyol.

46-60. (Cancelled)

Please add the following new claims:

61. (New) The polyether polyol of Claim 1 having a number average molecular weight of from 1,500 to 10,000 Daltons.

62. (New) The polyether polyol of Claim 1 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

63. (New) The polyether polyol of Claim 12 having a number average molecular weight of from 1,500 to 10,000 Daltons.

64. (New) The polyether polyol of Claim 12 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

65. (New) The polyether polyol of Claim 22 having a number average molecular weight of from 1,500 to 10,000 Daltons.

66. (New) The polyether polyol of Claim 22 having an unsaturation of less than or equal to 0.015 meq/g KOH.

67. (New) The polyether polyol of Claim 22 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

68. (New) The heteric polyether polyol of Claim 27 having a number average molecular weight of from 1,500 to 10,000 Daltons.

69. (New) The heteric polyether polyol of Claim 27 an unsaturation of less than or equal to 0.015 meq/g KOH.

70. (New) The heteric polyether polyol of Claim 27 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the heteric polyether polyol.

71. (New) The polyether polyol of Claim 32 having a number average molecular weight of from 1,500 to 10,000 Daltons.

72. (New) The polyether polyol of Claim 32 an unsaturation of less than or equal to 0.015 meq/g KOH.

73. (New) The polyether polyol of Claim 32 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

74. (New) The polyether polyol of Claim 36 having a number average molecular weight of from 1,500 to 10,000 Daltons.

75. (New) The polyether polyol of Claim 36 an unsaturation of less than or equal to 0.015 meq/g KOH.

76. (New) The polyether polyol of Claim 36 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

77. (New) The polyether polyol of Claim 41 having a number average molecular weight of from 1,500 to 10,000 Daltons.

78. (New) The polyether polyol of Claim 41 an unsaturation of less than or equal to 0.015 meq/g KOH.

79. (New) The polyether polyol of Claim 41 comprising an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.

80. (New) The composition of matter as recited in claim 43 wherein the polyether polyol has a number average molecular weight of from 1,500 to 10,000 Daltons.

81. (New) The composition of matter as recited in claim 43 wherein the polyether polyol has an unsaturation of less than or equal to 0.015 meq/g KOH.

82. (New) The composition of matter as recited in claim 43 wherein the polyether polyol comprises an amount of from 0.05 to 5.0 weight percent of the aluminum phosphonate catalyst or residue thereof, based on the total weight of the polyether polyol.